The first set of South African-manufactured aircraft parts for the Airbus A400M military transport aircraft were delivered to Germany recently for incorporation into the fuselage of the first aircraft.

Denel Aviation of Kempton Park, Johannesburg, recently completed the first set of fuselage top shells (roof sections) for the Airbus A400M. Denel is a major industrial partner in the multi-national A400M programme, which South Africa joined last year.

The 15-year top-shell manufacturing contract is worth 20 million euros (about R160 million) and currently accounts for between 10,000 and 90,000 man-hours annually. It follows an earlier contract for the design of the top-shells. Each of the Denel top shells weighs about 150kg and is made from advanced aluminium alloy forming using special 5- and 3-axis machines. As part of the infrastructure for the A400M work Denel has invested in new long-bed machines and a special treatment facility. The top-shells are a vital part of the “roof” of the aircraft, in front and behind the area where the wing is joined to the fuselage.

Denel is also responsible for the design engineering and manufacture of several other elements of the aircraft, the largest of which is the carbon composite wing-fuselage fairing. “Today is a proud moment for Denel and South Africa,” said Shaun Liebenberg, CEO, Denel. “Delivery of this first South African-produced element of the A400M marks the opening of an entirely new and exciting chapter in the evolution of Denel Aviation and which positions South Africa’s aerospace industry on a clear, sustainable growth path,” he added.

Through its stake in the aircraft programme, South Africa’s industry will participate in the design, engineering, industrialisation, manufacture and in-service support of the A400M – the world’s most modern military transport aircraft. “The delivery of the first top shells, on time and to specification, confirms that confidence we place in South Africa and our industrial partners, Denel and Aerosud,” affirmed Francisco Fernández Sáinz, Managing Director of Airbus Military.

Denel and Aerosud’s participation in the A400M underpins the South African Government’s new aerospace strategy which is characterised by a move away from prime contracting and a focus on niche engineering, design, manufacturing and development services for aerostructures and aircraft systems. It also confirms the objective of gaining access to the global supply chain.

As an Airbus Military A400M partner, South Africa has secured a vital and sustainable role for its industry over the next 30–50 years as a provider of engineering and manufacturing services as well as customer support for aircraft in service. South Africa will also acquire eight A400Ms from 2010, bolstering its strategic airlift capabilities and enabling it to support national, regional and multi-national peace and humanitarian missions.

The A400M order book currently stands at 192 firm commitments, including the seven European N410 launch customer nations, South Africa and Malaysia. The aircraft will first fly in 2008 with deliveries beginning in 2009. The new aircraft will enable air forces around the world to upgrade their overall capability for both humanitarian and peacekeeping operations.

An artists impression of the Airbus Military A400M top shell.

The actual aircraft is currently being assembled in Europe.
The main focus of the development was on the improvement of the gun control and fire control systems. As the supplier of the Integrated Fire Control System (IFCS) for the Rooikat, Denel was contracted by Denel Land Systems to complete this development.

To achieve the more stringent stabilization requirements, new Fibre Optic Gyros (FOG) were developed to replace the existing mechanical gyro. It was also decided to supplement the weapon with an additional Fixed Forward Gunner. Minor modifications were implemented on the elevation gearbox to reduce backlash and improve stiffness. This upgrade also required extensive upgrade to the control software.

During Phase 1 of the development, it was found that the capacity of the existing computer was not sufficient to cater for this upgraded software. A second development phase was then initiated to allow for the development of a new processor and interface cards. The new processor cards had to be interfaced with the older hardware in the computer.

The success of the upgrade development was completed in a successful firing trial with the development system in February 2005. After completion of this firing trial, four additional Rooikat systems were upgraded as part of the production phase.

All four systems completed the factory acceptance successfully and were subsequently delivered to the SANDF for evaluation during a User Operational Test and Evaluation (UOTE). As a result of the successful development work, the SANDF decided to contract Denel to retrofit all 76 Rooikat turrets.

The major objective of the turret upgrade was to:

- Improve the gun drive system and fire control computer to provide better weapon stabilization and target acquisition characteristics.
- Improve some main machine-interface functions.
- Improve the performance of the commander sight.
- Develop new commander and loader switches with new functionalities.
- Improve the commander seat.
- Implement some additional minor modifications to the turret.

When fully commissioned, the Spioenkop will be armed with the Umkhonto IR system and Denel 35 DPG guns.
MODULAR COMBAT VEHICLE FOR PROJECT “HOEFYSTER”

At a recent function hosted by Denel Land Systems, LMT and Patria, stakeholders had the opportunity to experience the impressive MCV first hand.

Project Hoefyster is an Infantry Fighting Vehicle (IFV) programme to replace the SA Army’s fleet of Ratel 6x6 armoured fighting vehicles (AFVs). The Ratel, which originally entered service 30 years ago, was a world leader at the time and included a number of variants including vehicles equipped with a 20mm cannon, a 90mm gun, anti-aircraft and guided missile launchers, mortars, and fire support vehicles. Despite being upgraded more than once, the Ratels are becoming obsolete, as there has been much progress in the design and manufacture of armoured and AFVs since they were originally built.

Hand held anti-armour weapons like the well-known, South African Hand-held anti-armour weapon which were originally built.

The Ratel’s armament capabilities to a level where they were no longer able to perform their original mission. The Ratels are considered obsolete, as there has been much progress in the design and manufacture of armoured and AFVs since they were originally built.

We'll be able to further improve on this accuracy in future. In a continuing drive to improve its acknowledged lead in tubed artillery systems, Denel shattered all previous artillery records by firing 75km earlier this year.

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The first Hawk Mk120 lead-in fighter trainers for the South African Air Force (SAAF) took off from Denel Aeronautics on 24 May 2009 for AFB Makhado, witnessed by the media and members of the SAAF, Armour and industry project teams.

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Denel Land Systems, the executive manager of Business Development at Denel Land Systems, has started to work. “This does not bode well for the SA Army which is increasingly being committed to peacekeeping and monitoring operations in the rest of Africa hence the need for a more modern AFV that offers better protection. Programme stakeholders were invited to the Gerotek testing facility west of Pretoria. They were offered the opportunity to actually ride in the MCV during high-speed runs, even rough ground designed to test the vehicle’s suspension, and to experience the MCV’s phenomenal climbing capability during climbing tests.

Denel’s Extended Range Platform (ARPL) programme has been in production in Europe. To date, the Finnish army has ordered 124 and the Polish army 60. The ARPL is a family of vehicles, comprising three models. The ARPL basic model, the AMV system platform, and the AMV module carrier.

The basic model can be adapted to a number of roles, hence the modularity concept. These include an armoured personnel carrier, infantry fighting vehicle, command vehicle, ambulance, fire support vehicle, tank destroyer (armed with missiles or guns), and mortar carrier.

The system platform model has a large rear compartment and can be fitted as a work shop vehicle, headquarters vehicle, or larger ambulance.

The vehicle is fitted with a Denel Land Systems turret equipped with day/night sights and laser range finding capability. A number of choices are available for the main armament ranging from a medium calibre cannon to mortar and missile options.

Our team had to integrate the turret with the Patria AMV chassis in record time to meet the Armorer requirement in time.

FIRST HAWKS DELIVERED TO AFB MAKHADO

The first Hawk Mk120 lead-in fighter trainers for the South African Air Force (SAAF) took off from Denel Aeronautics on 24 May 2009 for AFB Makhado, witnessed by the media and members of the SAAF, Armour and industry project teams.

Delivery of the two aircraft marked a significant milestone in the airlifter of South Africa’s 1999 joint procurement order for 24 Hawk and 28 Gripen fighters. Since then further batches of the Hawks completed at Denel were flown to Makhado to start the SAAF’s training programme there.

The first Hawk Mk120 lead-in fighter trainers for the South African Air Force (SAAF) took off from Denel Aeronautics on 24 May 2009 for AFB Makhado, witnessed by the media and members of the SAAF, Armour and industry project teams.

With the exception of Hawk SA-001, the flight test and development aircraft built in the United Kingdom, all of the SAAF’s other Hawks were assembled at Denel’s Kempton Park facilities.

In terms of an Industrial Participation agreement with BAE Systems, Denel is the exclusive manufacturer of tailplanes, airbrakes and flaps for the Hawk, with these components already being incorporated onto aircraft operated by or being built for South Africa, India, Bahrain and the UK’s Royal Air Force.

Other South African aerospace companies, notably ATE, Aerospace Monitoring Systems (AMS) and Tollomat are also involved in the programme. They provide the Hawk’s combat weapons and navigation suites, flight recorders (often referred to as the aircraft’s “black box” recorders), Health Usage Monitoring Systems (HUMS) and identification transponders that enable pilots to distinguish hostile aircraft from friendly ones.

Small BEC firms are part of the local supply chain on the Hawk programme, with support equipment on the Denel final assembly line having been built by several SMME companies.

The first Hawk Mk120 lead-in fighter trainers for the South African Air Force (SAAF) took off from Denel Aeronautics on 24 May 2009 for AFB Makhado, witnessed by the media and members of the SAAF, Armour and industry project teams.

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SAAF Director Air Force Acquisition, Brig Gen Philip Wilcock, commended all the contractual parties, including Denel, for completion of “the enormous task to date.” He said the delivery of the first two Hawks “demonstrates that the Hawk project is progressing well.”

Mr Mike Remenarow, BAE Systems Project Director, said “he was very proud that ‘Hawk is the first jet aircraft ever to be built in the democratic South Africa... and that these aeroplanes and their constituent components represent the liaisons and dedication of a whole new generation of young, talented and professional South African men and women, black and white.”

above: The Hawk assembly line at Denel Aeronautics.
	right: SAAF Hawks - 051 and 052 are prepared for their delivery flight to AFB Makhado.

Makhado.

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German Army V-LAP Ammunition Trials

The German Army recently visited our shores with their PzH2000 self-propelled artillery system to try out V-LAP world-class 155mm ammunition.

Munich, April 17, 2006 - The Howitzer 2000 Tank fired the long range V-LAP ammunition from Denel over a distance of more than 56 kilometres during ammunition tests in South Africa. This result was achieved with six DM72 propellant system modules. This new benchmark for the PzH2000 represents an increase of more than 40% compared to ranges of 40 kilometres previously achieved with base-bleed artillery projectiles.

The performance certificate was arranged by the German Federal Office of Defence Technology and Procurement (BWB) on behalf of Krauss-Maffei Wegmann at the Albkanturm test range South Africa. Site boundaries of the testing grounds limited the elevation to a maximum of only 727 m.

Based on sea level standard conditions, the system has a potential range capability of more than 60 km using an elevation of 800 m. This capability extends the operational envelope of the Howitzer 2000 Tank as a classic 155mm/52 artillery weapon into the domain previously reserved for rocket artillery.

V-LAP Ammunition

V-LAP technology combines base-drag reduction and rocket propulsion, and is deployed for both the Assegai and ERFB families of Denel 155mm Artillery projectiles. The V-LAP projectile shares an identical external interface with all other projectiles from each particular projectile family. V-LAP projectiles use the identical fuses, charges, packaging, storage and logistics that are required for the total projectile family. The Assegai V-LAP projectile includes an insensitive warhead main filling as well as PFF (Pre-Formed Fragmentation) warhead technology and is compatible with most 39-, 45- and 52 calibre artillery systems.

Howitzer 2000 Tank

The Howitzer 2000 Tank, a product of Krauss-Maffei Wegmann, is currently the most modern tank artillery system in the world. It is used by Germany, Greece, Italy, and The Netherlands, which is why the Howitzer 2000 Tank is also referred to as the Euro-howitzer.

On 28 April 2005 the South African government signed a contract with Airbus Military making the country a partner in the A400M aircraft programme. The final contract, signed in Pretoria by Minister of Defence, Mosiuoa Lekota, followed a Memorandum of Intention signed at the end of 2004.

Through its stake in the aircraft programme, South Africa’s industry will participate in the design, engineering, industrialisation, manufacture and service support of the A400M. The partnership agreement coincides with the launch of an initiative to secure and further develop South Africa’s aerospace manufacturing capabilities and capacities, as announced by the Minister of Public Enterprises, Mr. Alec Erwin, in his 2006 Budget Vote Speech to Parliament.

Minister Erwin said, “we are not an ordinary buyer of this aircraft. We are part of the production consortium.” It has been estimated that more than 3 160 jobs could be created locally through the Airbus deal.

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According to Airbus Military, in signing up as a partner in the Airbus Military A400M programme, South Africa is securing a vital role for its industry in this international programme. This initiative will see South Africa joining in at ground level, delivering sustainable opportunities for export oriented industrial activity over the next 30 to 50 years.

“The outcome for South Africa as a partner, that we have accepted South Africa’s investment in the A400M programme under similar terms to those of the seven European launch nations,” said Francisco Fernández-Sáez, Managing Director of Airbus Military. “On the basis that South Africa will take delivery of 8 aircraft, we will place work packages with industry worth at least 400 million Euros”.

Negotiations between the Government and Airbus Military have led to an agreement with the South African National Defence Force to receive a modern transport aircraft that will provide vital strategic airlift capability in support of South Africa and the African continent. The first delivery to the South African Air Force is scheduled for 2010.

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